

**REMARKS/ARGUMENTS**

In an Office Action mailed February 26, 2002, claims 1-9, 11-13, 15-19, and 10 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 21-29, 31-33, 35-39, and 40 of copending application 09/560,052.

Additionally, claims, 1, 3, 5-6, 9 and 11-13, were rejected under 35 USC 102(e) as anticipated by Jordan et al. (USPN 6,152,731). Finally, claims 2, 10, 14-16, and 19-20, were rejected under 35 USC §103(a) as unpatentable over Jordan in view of Bergersen (USPN 5,882,192).

As shown below, Applicants submit a Terminal Disclaimer to overcome the double patenting rejections. Additionally, Applicants traverse the Section 102 rejections and the Section 103 rejections and respectfully request allowance of all claims.

**The Non-statutory Double Patenting.**

Claims 1-9, 11-19, 15-19, and 10, were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 21-29, 31-33, 35-39 and 40, of the copending application 09/560,052. A Terminal Disclaimer is attached herewith. Withdrawal of the statutory double patenting rejection is respectfully requested.

**The §102 Rejection.**

Claims 1, 3, 5-6, 9, and 11-13, were rejected under 35 USC §102(e) as anticipated by Jordan et al. Jordan relates to a computer implemented method of creating a dental model for use in dental articulation. Jordan includes providing a first set of digital data corresponding to an upper arch image of at least a portion of an upper dental arch of a patient, providing a second set of digital data corresponding to a lower arch image of at least a portion of a lower dental arch of the patient, and providing hinge axis data representative of the spatial orientation of at least one of the upper and lower dental arches relative to a condylar axis of the patient. A reference hinge

axis is created relative to the upper and lower arch images based on the hinge axis data.

However, Jordan shows none of the specifics recited in the claims.

To illustrate, claim 1 requires receiving two or more three dimensional (3D) anatomical maps sharing a common plane specified by three or more marker points common to the two or more maps. Jordan's item 14 is reproduced below:

*"First, as generally shown by block 14, the data collection process includes capturing the three dimensional morphology of the individual dental arches of the patient. Preferably, such data includes data representative of the structure of all the teeth and the relevant gingiva, but the present invention is also of benefit when one or more portions of such dental arches are captured, e.g., one or more teeth in a section of one of the dental arches. There are a variety of methods available for providing such information and the present invention is not limited to any particular method but only as described in the accompanying claims. For example, tools which can be utilized to provide measured digital data representative of the upper and lower dental arches may include dental impressions, laser scans, stylus scans, and/or stereophotographs. The measured digital data concerning the upper and lower dental arches may be captured directly from the patient in a digital form, e.g., stereographs, or the information may be captured indirectly from the patient by removing the information from the patient in a nondigital form (e.g., dental impressions and study models) and later digitizing the information (e.g., slicing the dental impressions and digitizing the boundaries). Some of the varied processes for providing digitized data of dental arches include, but are clearly not limited to, laser scanning, photogrammetry, and those processes described in U.S. Pat. No. 5,078,599, U.S. Pat. No. 5,131,844, U.S. Pat. No. 5,338,198, U.S. Pat. No. 4,611,288, U.S. Pat. No. 5,372,502, Article entitled "Three-dimensional dental cast analyzing system with laser scanning," by T. Kuroda, et. al., Am.J.Ortho.Dent.Othorp., Vol.110[4], October 1996, pp. 365-69, and Israeli Patent Application Serial No. 114691 previously cited herein. Preferably, the digital data representative of the dental arches of a patient is provided by the process described in Israeli Patent Application Serial No. 114691 resulting in measured digital data representative of boundaries of sliced portions of dental impressions. Further, such digital data may include calculated data representative of surfaces of the dental arches as opposed to the measured digital data. Such calculated digital data for display of surfaces can be generated in numerous ways from the measured digital data as would be known to one skilled in the art resulting in data representative of various elements used for display of such surfaces, e.g., various calculated points, meshes, polygons, etc. (Jordan at Col. 9, lines 18-61)."*

No where in Jordan does it show receiving two or more three dimensional (3D) anatomical maps sharing a common plane specified by three or more marker points common to the two or more maps. This is at least one basis for traversing the rejection.

The Office Action noted that Jordan's Col. 9, ll. 18-20 shows the 3D morphology of the patient's individual arches. However, at best Jordan shows receiving a single 3D morphology, but there is no indication of receiving two or more three dimensional (3D) anatomical maps. In the claimed embodiment, the two or more 3D maps is needed for three dimensionally aligning the anatomical maps and the teeth model.

Moreover, Jordan is completely silent on the "sharing a common plane specified by three or more marker points common to the two or more maps." In the claimed embodiment, the three marker points common to the two 3D maps is needed for aligning the anatomical maps and the teeth model in 3D space. Jordan does not solve this problem and hence is completely silent on this aspect.

Further, the Office Action compared Jordan's 16 (Fig. 1) and col. 9 line 67, through col. 10, line 19 with "placing one or more marker points on one or more teeth." However, the cited section merely indicated that there are a variety of methods available for measuring the spacial relationship between the upper and lower dental arches of the patient to provide bite alignment data. There is no correspondence between Jordan's bite alignment data and the instant invention's placement of marker points on the teeth.

No where in Jordan does it show the use of markers, and no where in Jordan does it show the specifics of placing one or more marker points on one or more teeth; generating a digital model of the teeth with the marker points; and aligning the two or more 3D anatomical maps and the digital teeth model using the marker points. For example, the Office Action equates Fig. 1, item 10, as showing the generating a digital model for teeth with marker points. However, item 10 merely shows "create dental model." There is no discussion of the marker points in item 10. The Office Action also equated Jordan's item 11, in Fig. 1 with the aligning the two or more 3D anatomical maps and the digital teeth models using the marker points. However, Jordan's item 11 and Fig. 1 merely shows a dental articulation model. There again is no reference to aligning the 3D anatomical maps and the teeth model using the marker points.

The Office Action also asserted that item 10 of Fig. 1 shows “generating a digital model of the teeth with the marker points.” However, Jordan’s item 10 is completely silent on the “with the marker points” portion. As explained above, Jordan does not use marker points, and Jordan does not generate a digital model with marker points.

The Office Action further asserted that Jordan’s item 11 in Fig. 1 shows the aligning the two or more 3D anatomical maps and the digital teeth model using the marker points. Again, box 11 in Fig. 1 is completely silent on the marker points.

Since a §102 rejection requires that each and every element of the claim is shown in the prior art, Applicants respectfully submit that Jordan et al. cannot anticipate a present invention since it lacks a number of elements in their structural relationship. Moreover, since Jordan cannot anticipate claim 1, Jordan cannot anticipate the claims that depend therefrom. Withdrawal of the Section 102 rejection is requested.

#### **The §103 Rejection.**

Claims 2, 10, 14-16, and 19-20, were rejected under 35 USC §103(a) as unpatentable over Jordan et al. in view of Bergersen. First, Applicants note that the dependent claims 2 and are allowable as they depend from allowable independent claim 1. Additionally, independent claims 14 and 15 are allowable for the same reasons discussed above: no where in Jordan does it show receiving two or more three dimensional (3D) anatomical maps sharing a common plane specified by three or more marker points common to the two or more maps. This is at least one basis for traversing the rejection. A best Jordan shows receiving a single 3D morphology, but there is no indication of receiving two or more three dimensional (3D) anatomical maps. In the claimed embodiment, the two or more 3D maps are needed for three dimensionally aligning the anatomical maps and the teeth model.

Moreover, Jordan is completely silent on the “sharing a common plane specified by three or more marker points common to the two or more maps.” In the claimed embodiment, the three marker points common to the two 3D maps is needed for aligning the anatomical maps and the teeth model in 3D space. Jordan does not solve this problem and hence is completely silent on this aspect. As explained above, Jordan does not use marker points, and Jordan does

not generate a digital model with marker points. There is no correspondence between Jordan's bite alignment data and the instant invention's placement of marker points on the teeth. No where in Jordan does it show the use of markers, and no where in Jordan does it show the specifics as claimed.

Turning now to Bergensen, Bergensen relates to a method and apparatus for diagnosing orthodontic conditions of an individual. The apparatus includes an outer case and a user interface disposed on the outer case for communicating with the individual. The apparatus further has diagnostic hardware including at least one digital camera carried within the case adapted to take a plurality of video images of the teeth and mouth of the individual. The apparatus further has electronic circuitry which is preprogrammed with statistical data for comparison to actual data collected by the diagnostic hardware and transmitted to the electronic circuitry. The circuitry is further adapted to diagnose whether the individual has correctable orthodontic conditions. The apparatus is further adapted to dispense instructions to the individual for receiving proper corrective orthodontic care. The method of the invention includes providing an apparatus adapted to take various digital images of the individual's teeth and mouth. The digital images are analyzed by the electronic circuitry and compared to the statistical data preprogrammed within the apparatus for diagnosing whether the individual has correctable orthodontic conditions. The method further includes the steps of informing the individual as to whether their orthodontic conditions are correctable and instructing the individual on how to correct the orthodontic conditions diagnosed and dispensing an appropriate appliance. However, Bergensen is also devoid of marker as recited in the claims.

As discussed above, Jordan et al. neither anticipates nor renders the invention obvious. Bergensen similarly does not show any aspects of the invention as claimed. For example, Bergensen does not show the marker points common to the two or more maps. Bergensen does not show the placement of one or more marker points on the teeth. Bergensen does not also show the step of generating a digital model with a marker point and aligning the two or more 3D anatomical maps and the digital teeth model using the marker points. Hence, neither Jordan or Bergensen can render claims 2, 10, 14-16, and 19-20, obvious. Withdrawal of the §103 rejection is respectfully requested.

Appl. No. 09/560424  
Amdt. dated May 29, 2003  
Reply to Office Action of February 26, 2002

PATENT

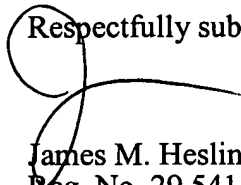
Applicants also note that a Power of Attorney naming the undersigned as Attorney of Record, along with Bao Tran, Esq., is being submitted simultaneously with this Response.

**CONCLUSION**

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

  
James M. Heslin  
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Attachments: *Terminal Disclaimer*  
*Power of Attorney*

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